

AMATEUR SATELLITE REPORT

AMSAT's Newsletter for the Amateur Space Program. (See last page for details)



Amateur Satellite Report is endorsed by the American Radio Relay League as the special interest Newsletter serving the Amateur Radio Satellite Community

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Short Bursts

- According to WA2RDE, ON7HP claims to have contacted his 100th country on AO-10. Although not currently confirmed by ASR, Peter, ON7HP, was known to have been closing on the milestone recently. His crossing the magic 100 mark was rumored imminent. If substantiated it would mark an important first in the annals of OSCAR. AO-10 had been in operation less than a year when word of Peter's presumed achievement was received. More on this later.
- John Champa, K8OCL, spoke at yesterday's (15 July) Hall of Fame Hamfest in Canton, Ohio. John led the AMSAT Forum at the 10th annual event.
- Roger Soderman, KW2U, represented AMSAT at the 2nd Annual Conference of Private Sector Space Research and Exploration at New York City's Hayden Planetarium 27 May. Roger's talk was entitled "Satellites On A Shoestring". The event was scheduled to coincide with another conference, "Moving Industry Into Space" during which top government and industry leaders presented ideas on the commercialization of space. Other speakers on the 27th from the "Private Sector" conference included Jesse Eichenlaub of the Independent Space Research Group, Ronald Molz, Independent Space Projects Committee.
- A brand new brochure called "The Radio Amateur Space Program (What is all the excitement about)" is included in the new ARRL Satellite Locator package. Written by K8OCL, this superb document replaces the obsolete "What Is AMSAT" which had been a mainstay for years. It is available for an SASE from AMSAT Headquarters and is a fine hand-out for hamfests, club meetings and the like. A real fine job by K8OCL. Read this one and be proud to be part of the AMSAT team!
- The enhanced C64 AMS 20-64 version of the W3IWI program has been mailed out but, due to a clerical error, the second sheet of instructions was omitted. The additional sheets are being mailed now.
- The AMSAT-Stoner 25th Anniversary Challenge Cup ended on 14 July. We'll have a recap of the event and some preliminary claimed scores as soon as possible.
- The first dry-run of the new AMSAT Technical Achievement Award on-the-air test should be held in the next few weeks with the first official record run anticipated in late September. Object of the test will be to demonstrate the receive sensitivity of your satellite station. A basic award will be made and then endorsements will be made to the

basic award for subsequent improvements in receive sensitivity. Project Manager K1WHS is working out the technical details now to insure a fair, challenging project. A series of handsome awards will distinguish this program so tidy up your antennas now and tweak those preamps for the excitement just a few weeks away!

- A new booklet, "Establishing and Operating An Amateur Radio Satellite Gateway Station for Your Local Repeater" is available in limited numbers from AMSAT Headquarters while the supply lasts. The 14 page brochure by WA2LQQ covers the basics in straightforward terms. Send an SASE



John Champa, K8OCL (left) accepts donation of 70 cm power amplifier on behalf of AMSAT from Everett Gracey WA6CBA, Vice President of Mirage. The presentation took place at the 1984 Hamvention in Dayton. The donation will go into the prize cache for the new Member Recruitment Drive coming soon.

(\$0.37) to AMSAT requesting the brochure. Insure the envelope is a business size or larger. A small donation to cover reproduction costs is appropriate.

- UO-11 continues on the comeback trail with gravity boom deployment, the next major milestone, in sight for the next few weeks. All's going well now.
- Attending the ARRL National Convention in New York? Contact N2CF at HQ if you can help out in the AMSAT booth 20-22 July.

Tampa Ham Becomes First Walkie-Talkie-Satellite Terminal

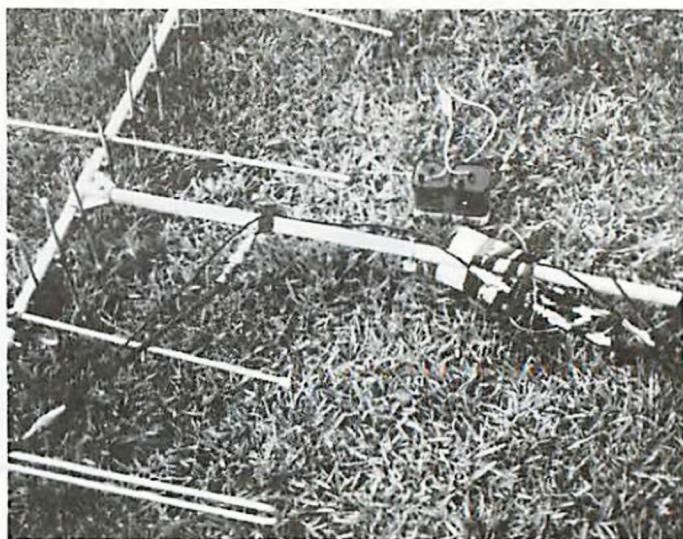
Against a backdrop of the first HT-to-HT QSO using AO-10 as reported in these columns recently and concurrent with the popular ARRL Field Day event comes word of the first successful Walkie-Talkie-Satellite QSO. Moreover the claim by KB4CRT of Tampa, Florida, is that there were no gateways or other "assists" involved.

That's the claim of John Silberman, KB4CRT, who, in an interview with ASR says that on the morning of 23 June 84 he carried his entire AO-10 station on his back, strapped to his waist, lashed to his arms, stuck in his pockets, and in his hands, etc. The accompanying photos taken by John's colleague Robert Uiterwyk, WB4IOA, document the event in KB4CRT's back yard.

According to John, "There were no gateways, connections to the AC power mains, nor car batteries nor anything else that would prevent ambling freely around" carrying



KB4CRT and his "man-pack AO-10 station. Now...where is that satellite?



the complete terminal with him. It was literally a WT or walkie-talkie, the precursor of the HT or handi-talkie.

The historic QSO was achieved at 0942 UTC, 23 June 84 with none other than ON7HP, who now lays claim to his own first. (See related story on ON7HGP claims 100 countries on AO-10 elsewhere in this issue.) The SSB QSO had signal reports exchanged of 5/7 (ON7HP) and 5/2 (KB4CRT).

KB4CRT's equipment was described to ASR as follows. For the 70 cm uplink John used an IC-402 with a 20 watt solid state amplifier powered by two lantern batteries. On receive John used an ARR GaAsFET preamp powered by some penlight cells. Both the preamp and the battery were taped to the antenna mast. The receiver was an FT-290 portable. The antenna was a combination 2m/70cm beam built by J-Beam. The 70 cm linearly polarized beam had 12 elements and a claimed 12 dBd gain according to KB4CRT. The 2 meter beam, orthogonal to the 70 cm yagi, had 6 elements and a claimed gain of 8.5 dBd according to KB4CRT. The 2 meter beam was also linearly polarized.

After chatting with Peter, ON7HP, KB4CRT went on to QSO DB8KJ, DJ0PQ and G6CHP just to prove the first one had "not been a fluke!" Asked what inspired him to this interesting but admittedly bizarre demonstration, John replied it was "just for fun" and "to show it could be done!" He adds, "With the news about gateways, I wanted to take it one step further."

A pilot, John says he's now scheming how to become the first aeronautical mobile to work through AO-10.

Second Member Recruitment Drive Kicks Off In August

AMSAT General Manager Bill Lazzaro, N2CF, announces that the Second Annual Member Recruitment Drive commences 1 Aug. and will run until 31 Dec. 84. A sizeable prize offering is promised with the grand prize presently under wraps but rumored to be one of the new, super-deluxe rigs. Last year's prizes included the Yaesu FT-726R as Grand Prize. It was snared by N3CEG in a down-to-the-wire shootout with KW2U.

While some modifications to the rules are under consideration by N2CF and KO5I, the basic premise remains

unchanged from last year: sign up new members. The more new members you bring in, the bigger your prize. And every one will get a prize for even one new member signed up.

Complete rules and prize details next time. But it's time to extend your hand and welcome aboard new members. AMSAT needs them and you can benefit doubly: By helping to strengthen AMSAT and by winning yourself a dandy prize; maybe even the BIG one! Come 1 Aug. you should be on your way. Send an SASE to HQ for membership applications and get started on your road to that Grand Prize or one of the many other prizes!

Amateur Satellites and Emergency Communications

Special to ASR by N4AZI, David C. Eanes

Public service in the form of emergency communications has long been a part of the amateur radio scene. It forms a *raison d'être* for the Amateur Radio Service in the United States and other nations as well. Public service forms the basis for Amateur Radio spectrum allocations in the international arena.

Amateur Radio typically uses virtually every resource available to it for emergency communications and message handling. But until recently Amateur Radio satellites have not been a tool that could be used for emergency communications. The reason is obvious. A 10 or 15 minute orbit is much too furtive an opportunity to count on. Now with AO-10 operational and with the promise of more Phase III satellites and even a hint of geosynchronous, Phase IV birds at hand, it may be time to examine the potential for emergency communications inherent in OSCAR.

We believe this valuable resource should be developed for a number of good reasons. First, it is tradition. Just as emergency communications (EC) forms the basis for being the Amateur Radio Service, it should for an integral part of its sister, the Amateur Satellite Service. Second, we have a valuable and reliable resource in AO-10 that should be used to its fullest potential. With the advent of Phase IV perhaps just a few years away, it's not too early to set the foundation for systems and procedures that will fully come into play when a geosynchronous resource is available. We can use AO-10 now as the development ground for those systems and procedures while in the interim maximizing the utility of our present resources. Finally, with many new modes of communication such as packet networking and gateway access to satellites being developed, we have the ability to assemble a working model of a national and international EC network unprecedented in capacity, accuracy, timeliness and reliability.

We therefore propose the institution of an AMSAT Special Project Team dedicated to the formulation of a comprehensive program we will call the Amateur Satellite Emergency Communications System (ASECS). This team would begin at once the development of a program for EC and operations to be implemented on AO-10 and later satellites. We would appreciate sharing your thoughts on these initial concepts and invite your expressions of interest in being a part of this effort. You may contact me directly at the address below or via AMSAT HQ or Vice President/Operations



Will this man be "Ham-In-Space" number 3? Perhaps! This is Dr. Ron Parise, WA4SIR, who was recently selected as Shuttle Payload Specialist.

KO5I. David C. Eanes, N4AZI, 4866 Drusilla Lane, Baton Rouge, LA 70809.

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The following has recently been released by G3YJO at Surrey.

Amateur Satellite Technical Planning Meeting

The Meeting, held near Cheltenham, England, from June 30th to July 3rd, was finally attended by: G3YJO, W3GEY, DJ4ZC, KA9Q, KE3D, HA5WH, W4PUJ, NK6K, VE1SAT/VE6, G8DQX, DK1YQ, DJ5KQ, ZL1AOX, ZS6BNT.

The group discussed the following topics:

- * PACSAT — presentation of project status, design summary, schedule.
- * UoSAT — presentation of programme status, attitude control results, experiment plans.
- * AO-10 — spacecraft status, 1984/5/6 eclipse studies, operating schedules and modes.
- * ARIANE 4 — launch opportunity status, Phase IIIC configuration, Phase IV (geostationary) proposal.
- * Technologies — propulsion technologies, attitude control/stabilisation technologies, new processors/controllers, ranging, modulation techniques/protocols/data standards, separation systems for new missions.
- * Organization — discussion of improved international co-ordination on satellite technical standards, spectrum utilisation, launch opportunities, spacecraft operation, information dissemination, fund raising.

The formation of an 'Amateur Satellite Service Council' was proposed to expedite the above with representation from all bona fide amateur satellite groups worldwide. Details of the draft proposal will be included in a later

Bulletin after further refinement.

The Meeting was considered to have been most fruitful and resulted in the definition of future goals and missions, while ensuring the maximum potential is realized from current programmes.

Phase IIIC

The proposed Phase IIIC spacecraft configuration is as follows:

- * Mode-B, as AO-10
- * Mode-L, similar to AO-10 but with anticipated + 20 dB amplification
- * Packet Communications
- * S-Band Beacon

Much of the necessary flight hardware already exists for the basic spacecraft and it is proposed that, in addition to contributing the power module as on AO-10, HA5WH and the Technical University of Budapest may undertake the mechanical integration of the Phase IIIC spacecraft.

UoSAT-OSCAR 11 Status

The majority of our efforts this week have been concerned with the refinement of automated attitude control manoeuvres on OSCAR-11 using the magnetorquers controlled by the on-board 1802 microcomputer.

The first algorithm used last week only used the sign of the z-component of the earth's magnetic field (measured at the spacecraft) and the result of running this was that the craft 'locked' to the magnetic field very successfully, but with residual oscillations of up to 40 degrees. The newer program, taking into account the changing absolute magnitude of the field by using a simple measure of the transverse component as well, has reduced the oscillations to around 15 degrees. Analysis of whether this is small enough to permit boom deployment is continuing, but a third algorithm is ready should further manoeuvres prove necessary.

UoSAT-OSCAR 11 Operations Schedule

We will be using dwell telemetry, with channels 01, 02, 03, 61 and 67 transmitted in a one-line frame with the standard checksum, thus providing very fast data for ground analysis. (Note channel 67 has been added to monitor the computer command. The MSB of channel 67 is the magnetorquer demand flag (set when commands sent if they are enabled), the other 3 bits in the first digit giving type of firing (based on a z-field change or a transverse field change) and the bottom 8 bits giving a measure of the transverse change.)

The following orbital data supplied by NSAHD.

SATELLITE	UO-11	UO-9	AO-10
OBJECT NO	14781	12868	14129
IDENTIFIER	84-0218	81-1008	83-05802
ELEMENT SET NUMBER	32	657	107
ISSUE DATE	07/02/84	07/03/84	07/03/84
REFERENCE EPOCH	84 173.22122775	84 179.42164536	84 177.56936827
DECAY RATE	0.00000162	0.00003276	0.00000020
INCLINATION	96.2404	97.5928	25.5969
RAAN	235.4097	154.1463	192.2384
ECCENTRICITY	0.0012352	0.0004345	0.6084343
ARG OF PERIGEE	276.1520	73.9992	283.3262
MEAN ANOMALY	81.6273	286.1680	19.9695
MEAN MOTION	14.51377263	15.25991619	2.05846041
REV OF REF EPOCH	1629	15110	1109

SATELLITE	RS-3	RS-4	RS-5
OBJECT NO	12997	13000	12999
IDENTIFIER	81-120A	81-120D	81-120C
ELEMENT SET NUMBER	97	203	170
ISSUE DATE	06/16/84	06/26/84	02/26/84
REFERENCE EPOCH	84 175.37318535	84 162.42749975	84 173.10840070
DECAY RATE	0.00000004	0.00000004	0.00000004
INCLINATION	82.9582	82.9543	82.9555
RAAN	129.6569	145.5204	141.1502
ECCENTRICITY	0.0058949	0.0019015	0.0012128
ARG OF PERIGEE	336.6246	80.0059	89.9522
MEAN ANOMALY	23.2143	280.3135	271.2623
MEAN MOTION	12.15587354	12.06664729	12.05046201
REV OF REF EPOCH	5215	10927	11041

SATELLITE	RS-6	RS-7	RS-8
OBJECT NO	13002	13001	12998
IDENTIFIER	81-120F	81-120E	81-120B
ELEMENT SET NUMBER	83	161	279
ISSUE DATE	07/03/84	07/03/84	06/26/84
REFERENCE EPOCH	84 176.82382726	84 176.81306201	84 175.37993393
DECAY RATE	0.00000003	0.00000004	0.00000003
INCLINATION	82.9587	82.9577	82.9576
RAAN	130.8530	135.5534	141.8627
ECCENTRICITY	0.0050992	0.0023122	0.0019547
ARG OF PERIGEE	352.4966	17.9646	134.2849
MEAN ANOMALY	7.5343	342.2239	225.9853
MEAN MOTION	12.13562322	12.08682632	12.02945197
REV OF REF EPOCH	11164	11190	11049

SOURCE: NASA PREDICTION BULLETIN

NASA GODDARD SPACE FLIGHT CENTER, CODE 512, GREENBELT, MD. 20771

REASONABLE EFFORT HAS BEEN MADE TO ELIMINATE TYPOGRAPHICAL ERRORS. NSAHD

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